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Monitoring a national open access funder mandate

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Abstract

Acknowledging the benefits associated with open access (OA) to scientific literature, the Foundation for Science and Technology (Fundação para a Ciência e Tecnologia - FCT), the national funding agency for science in Portugal, defined an OA policy that aims at ensuring free, online access to publications arising from FCT-funded research. Key to the implementation of FCT OA policy is the existence of a solid and mature repository infrastructure, the Scientific Open Access Repository of Portugal – RCAAP. Furthermore, RCAAP is part of PTCRIS, an integrated research information ecosystem whose holistic vision of the research information landscape allow us to link implementation of FCT OA mandate to added value services, with great benefits for the research community. In these paper, we describe the strategy adopted to implement and monitor a funder's OA mandate in an unprecedented integrated manner, using ground-breaking technical solutions built upon an existing infrastructure to address new challenges.

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1. Introduction

Information and communication technologies, and in particular, the internet has fundamentally changed the way that science and scholarly research is communicated. The possibility of a world-wide delivery of knowledge allied to the willingness of scientists and scholars to share their research has resulted in a global movement towards open access

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publishing and archiving. Open Access (OA) refers to the practice of providing on-line access to scientific information that is free of charge to the end-user and that is re-usable, with the aim of promoting a widespread dissemination of research results thereby enhancing their use, application and impact.

Momentum for OA has been growing as numerous funding agencies and institutions worldwide implement OA policies. However, critical for the success of OA policies is the availability of the required infrastructure to implement such policies. The European Union (EU) for example has been striving to foster OA and to boost the benefits of public investment in the research funded under the Horizon2020 research programme. To this end, a scholarly communication infrastructure – OpenAIRE¹ - has been developed to manage and monitor the outcomes of EU-funded research supporting OA policies.

In Portugal, the development of a solid and mature repository infrastructure, the Scientific Open Access Repository of Portugal – RCAAP² – has been key to recent developments concerning OA policies. Launched in 2008, RCAAP has contributed not only to increase the visibility of Portuguese universities on the internet, but also to the rapid development and spread of OA repositories within several academic institutions. To this end, the RCAAP project has focused on a) the development of the RCAAP portal, aggregating, indexing and providing unified access to OA research results from Portuguese institutional repositories (IR); b) offering a free repository hosting service (SARI), to facilitate the creation and management of IRs in many Portuguese research and higher education institutions; and c) training and advocacy about repositories and OA³. These activities resulted in a solid basis to support the establishment of the mandatory OA policy of the Portuguese major public funder – Foundation for Science and Technology (FCT)⁴ – which was released in 2014. Taking advantage not only of the underlying infrastructure but also of the services and support provided by RCAAP, FCT launched a public consultation on proposals for policies on OA, resulting in a policy on OA for publications⁵ which requires that all publications or research outputs subject to peer-review or another form of scientific review must be deposited into a repository hosted within RCAAP.

Having an OA policy in place, the major challenge becomes to reinforce and monitor compliance with such policy. This involves showing ways, and providing tools and incentives, to incorporate repository deposit in particular and Open Access in general, into academic workflows. It also requires the integration and interoperability of repositories with other components of the research information systems landscape. In this domain, a national program – PTCRIS⁶ is underway to promote a wide and effective integration of several national and international information systems, thereby creating a coherent and efficient research information ecosystem. Noteworthy, under PTCRIS initiative, FCT is the first national funder using the OpenAIRE data model and services for funding information. Such collaboration has identified as outputs from FCT projects around 13000 publications deposited in an OpenAIRE⁷ or RCAAP repository and opened up new possibilities to monitor compliance to the FCT OA policy.

This paper focus on the implementation of compliance monitoring measures of FCT OA policy. Here we describe a strategy whereby new technical solutions are built upon existing infrastructure to implement an efficient monitoring process with great benefits for all stakeholders.

2. FCT Open Access Policy

The Foundation for Science and Technology (FCT), the Portuguese national funding agency for science, research and technology, widely recognizes the benefits of Open Access, not only to the research community, giving authors and their works greater visibility, readership and impact, but also at the socio-economic level, bringing science and society together.

Specific benefits of OA to Portugal acknowledged by FCT are the promotion of nationally-funded research, an expected increase in research collaborations with different countries and across different disciplines and, particularly, defense and affirmation of Portuguese language (along with other Portuguese-speaking countries) and research. In accordance, FCT has been actively involved in the implementation of strategies to promote immediate, online, free availability of research outputs to the research community and to the public at large. One of such strategies was the

definition of the FCT Policy on Open Access. This process went through careful consideration since an Open Access policy by FCT, the major public research funder in Portugal, represents a national OA policy *de facto*. After public consultation on the proposals for policies on OA, FCT adopted its OA policy on January 2014, effective from 5th May 2014.

The policy states that all beneficiaries are required to deposit and ensure Open Access to the peer-reviewed manuscripts arising from FCT-funded research and accepted for publication on a scholarly outlet. These include:

- Final manuscript of a peer-reviewed paper accepted for journal publication (or equivalent), including all modifications from the peer review process, but not yet formatted by the publisher;
- Conference proceedings;
- Books, book chapters and monographs subject to a peer-review process or other types of scientific scrutiny;
- Doctoral theses.

Publications must be deposited in one of the open access repositories part of the RCAAP network of repositories, which usually is the Institutional repository of the research institution with which the beneficiary is affiliated.

Deposit of the publication must be made as soon as possible, preferably immediately on acceptance for publication but at the latest on publication. Each beneficiary must ensure Open Access to the deposited publication — via the repository — within 6 months of publication (12 months for publications in the social sciences and humanities). Exceptional timeframes apply to books, book chapters and monographs, for which Open Access must be ensured within 18 months of publication, and doctoral theses for which Open Access must be ensured within 36 months of the PhD degree award.

Publishing in an Open Access journal is also regarded favorably, except if there are any unjustified, exorbitant charges associated. Costs of Open Access publishing, such as Article Processing Charges, are eligible for refund as research costs, within the remit of the funding granted and throughout the duration of the research project but are thus subject to a number of cost eligibility requirements. The most important of these are:

- Open Access to the publication must be immediate and no embargo is allowed;
- The publication post-print must be given permission to be deposited in repositories other than the publisher's own repository;
- The publication's full content must be attributed a Creative Commons CC-BY license (or equivalent).
- No restriction to its access or re-use is allowed.

In all cases, the authors are encouraged to retain their copyright and grant adequate licenses to publishers. Licensing the publication with a Creative Commons CC-BY license is recommended except where APC's are to be refunded by FCT, in which case it is mandatory.

The policy, although accepting Gold Open Access, reflects a conscious strong preference for Green Open Access. Green Open Access maximises investment return in and use of existing e-infrastructures, particularly RCAAP, and benefits from national know-how in this domain, facilitates maximum dissemination of scientific production with a minimum price tag attached and, at the same time, eliminates the cost unpredictability and complexities of managing APC's frequently associated to Gold Open Access publications.

To monitor implementation of its OA policy, FCT adopted a strategy that links compliance, namely through the deposit of the publication in one of RCAAP's repositories, to the pre-existent publication reporting procedures in use at FCT within the scope of research project evaluation and project expenditure management systems. This strategy follows the recommendations of the "PASTEUR4OA report on policy effectiveness"⁸ which describes a significant correlation between such a link and the Open Access and Restricted Access deposit rates. Also, the RCAAP network becomes instrumental in supporting compliance with the FCT Policies on OA since only the scientific outputs deposited in a repository of the RCAAP network will be object of scientific evaluation for funding purposes.

3. Implementation of a compliance monitoring strategy

The compliance monitoring strategy we adopted involves a workflow (Fig. 1) that starts on the repository with the deposit of the publication arising from FCT-funded research. In this step, the publication is associated with the project and made available on the repository. The next step is ensured by the RCAAP Search Portal that harvests all the information of the repositories and identifies the funding information. This enables fill-in of the project page with all the identified publications and the creation of scientific reports. Finally, these reports are requested by the funder reporting system within the scope of the midterm or final project reports for evaluation purposes.

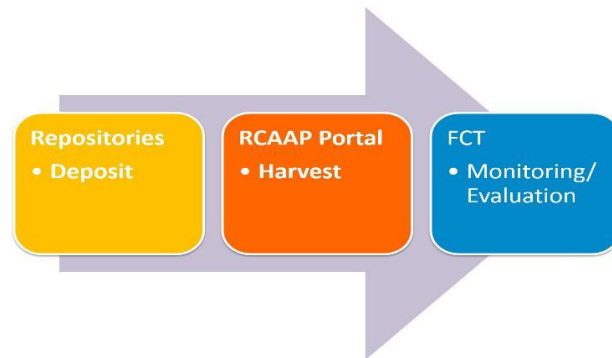


Fig. 1 - The Monitoring Process

The RCAAP project manages directly on the repository hosting service 28 institutional repositories that are automatically compliant to FCT OA policy. As for the other repositories managed by the institutions the technical information and examples are provided.

The key requisite to allow the compliance is the identification of the project on the deposit process. For this, the project implemented a new addon based on the **OpenAIRE API**² that aggregates a list of different funders (Fig. 2).

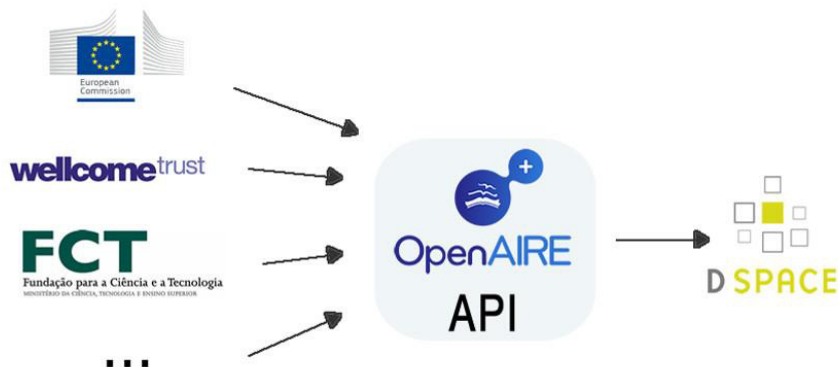


Fig. 2 - OpenAIRE API and DSpace Addon

² <http://api.openaire.eu>

Initially aiming at providing open access for research financed with European funding, the OpenAIRE project allows the use of the infrastructure to integrate other funders. By now the OpenAIRE supports European Commission with FP7 and H2020 funding streams, MSES and CSF from Croatia, SFI - Science Foundation Ireland and FCT (Fundação para a Ciência e tecnologia), and other non-european: Wellcome Trust, Australian Research Council, National Health and Medical Research Council, National Science Foundation.

Following FCT's participation on a pilot for funders at OpenAIRE, a list of projects was sent to be integrated and recognised by the infrastructure. This led to other actions:

- **Text mining** - The list of projects and particularly the identifiers have been used to identify existing publications funded by FCT on the data sources of OpenAIRE.
- **New funder on the API** - The inclusion of the list of projects on the OpenAIRE API, on the general API and also on the API for specific repository applications like DSpace and Eprints.
- **New funder on the Search Portal** - For the end user, the new funder implies the creation of new filters by funder, the project page of the funder and all the information available for the EC projects.

The initial process of text mining and the availability of the results on the OpenAIRE Portal allowed the repository managers to introduce, based on OpenAIRE guidelines, the code associated to the project, thereby allowing the correct identification of the projects on the RCAAP Search Portal, as well as on the OpenAIRE Portal, even if redundant on these particular cases.

To support the management and the correct compliance on the repositories, the **OAI-PMH Validator**³ integrates a specific validation profile to identify the publications with projects associated for the national funding body FCT. Some **new functionalities** have been implemented on the existing Search Portal to support the policy. Each project has a specific **project page** where all the publications are listed and where the project manager can **create a report of the publications** (Fig. 3), integrate with a **widget** the information in the project website or access more information about the project itself.

Integrated on the search process, the users can now filter the search results by funder, funding programme or project. The same approach has been implemented on the advanced search page.

Report

Create a report with all publications from the project or scholarship in the current date for FCT scientific report.

 Generate report

Fig. 3 - Report Generation for funder on the search Portal RCAAP

A new internal dashboard have been developed to provide the RCAAP Project and the national funder with information regarding publications with associated projects, organized by funders. These identification is based on OpenAIRE guidelines⁴ (Fig. 4).

³ <http://validator.rcaap.pt>

⁴ <https://guidelines.openaire.eu>

This internal dashboard allows us to filter the data by funder, funding programme, project, type of access, language, repository, document type, etc.

Filtros

Data a considerar:

Ano de publicação:

Tipo de documento:

País:

Repositório:

Abrangência do relatório:

Financiador:

Programa de financiamento:

Project ID:

Política de acesso:

Idioma:

Fig. 4 - Filters on internal dashboard

The results of the filter are available by year and repository, and the values are clickable to retrieve the publications on the Search Portal (Fig. 5).

Quadro geral

Mostrar: repositórios

Procurar:

Repositório	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Desconhe
antropologicas	-	1	-	-	1	-	-	-	-	-	0
arca	-	2	57	53	31	9	1	1	2	-	0
bibliotecadigitalipb	78	119	140	52	138	7	-	-	-	-	0
bspm	-	1	-	-	-	-	-	-	-	-	0
cadbad	-	-	1	1	-	-	-	-	-	-	0
cbad	-	4	-	-	1	-	-	-	-	-	0
chlc	-	-	-	-	1	1	-	-	-	-	0
chporto	-	-	1	5	1	-	-	-	-	-	0
digituma	-	-	-	-	-	3	-	-	-	-	0
fctunl	1	28	2	5	9	26	-	-	2	-	0

A apresentar de 1 até 10 de 40 repositórios

Anterior [1](#) [2](#) [3](#) [4](#) Seguinte

Fig. 5 - Screenshot displaying results of a search on internal dashboard

The tabular data is then organized into graphics to allow for an easy understanding of the current status (Fig. 6).

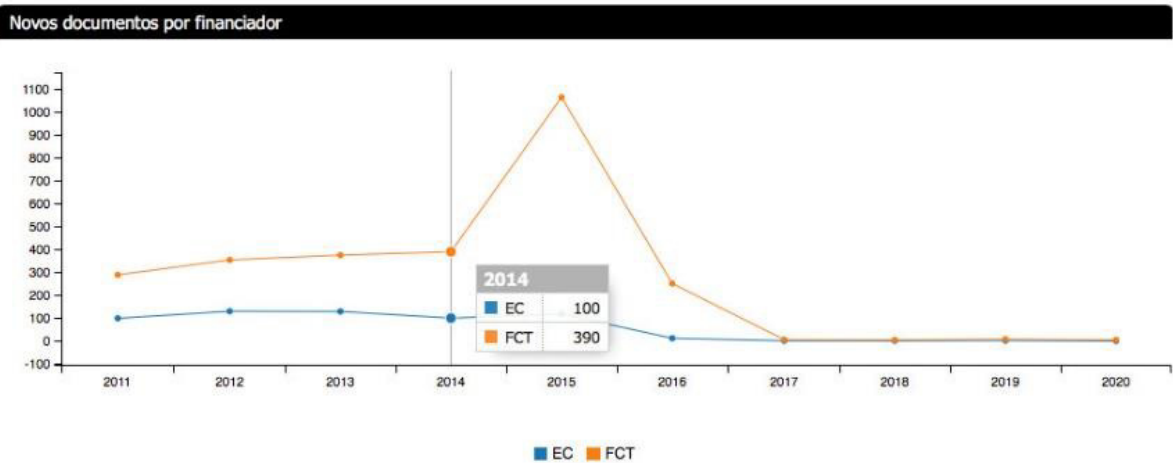


Fig. 6 - Graphic representation of the data

The information is also available to be downloaded as CSV format and allow the creation of other types of analysis.

Finally, the RCAAP Search Portal integrates a public API⁵ that allows any institution to search for information that is organized on the Portal. The initial objective of this interface is to provide an open interface to the community based on REST with JSON and XML. A second objective is to allow integrations for the legal deposit of thesis and dissertations and the integration with the funders, in this particular case with FCT. An example of the possibilities are to give a list of publications based on the grant number of the project (Fig. 7).

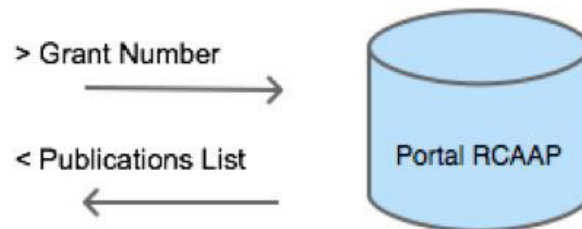


Fig. 7 - API of the Search Portal

Besides the general approach of the API, there are plans to allow the exposure of CERIF-XML at the Search Portal level.

4. Conclusions

Removing access barriers to research results will accelerate scientific research, enrich education and, ultimately, contribute for the sustained progress in society. The benefits associated with OA to scientific literature has been

⁵ <http://www.rcaap.pt/api/>

acknowledged by FCT, the funding agency that supports science, technology and innovation in Portugal. Indeed, FCT has actively promoted OA in Portugal by supporting RCAAP, the national OA repository infrastructure which has been key to increase the visibility of Portuguese universities and also for the development of institutional OA repositories. More recently, FCT Policies on OA have come into force to ensure that peer-reviewed publications arising from FCT funding are deposited in one of the OA repositories hosted within RCAAP and, therefore, freely available.

Monitoring an OA policy implementation is a significant challenge. Here we describe a strategy to implement compliance monitoring measures. This strategy has greatly benefited from a holistic view of the research information landscape provided by PTCRIS. The PTCRIS program has brought together all relevant stakeholders and created an open ecosystem where interconnected information systems can cooperate to deliver reliable, authoritative, useable, and comparative data. The work carried out by FCT, OpenAIRE and RCAAP is an example of such cooperation. OpenAIRE data model and services are being used to associate FCT's funding information with research outputs deposited in OpenAIRE or RCAAP repositories. This initiative supported by solid infrastructures provided a mechanism to implement a monitoring process for the FCT OA policy. On top of this, we linked the OA compliance monitoring process with the reporting and evaluation procedures required by the funder. More specifically, the RCAAP Search Portal was developed to allow automatic generation of reports, listing the publications associated with a specific grant, which can be used to meet the reporting demands of the funder. This added value service greatly contributes to make the RCAAP Search Portal central in the national information research ecosystem. More importantly, it results in great benefits for both FCT, by reducing administrative burden and allowing efficient OA compliance monitoring, and the research community, by simplifying scientific and financial reporting in the context of midterm or final project reports.

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